

Patent Claims

1. Method for teaching a knowledge-based database for automatic defect classification, characterized by the following steps:
 - 5 - Selection of a review data file
 - Input of parameters and data by the user on one page (50) of the learning mode whereby the parameters and the data are known to the user,
 - 10 - Starting an alignment procedure and a procedure for adjusting the light intensity;
 - Automatic adjustment of the optimal intensity of the lighting by approaching a few defects and if necessary regulating to the optimal illumination;
 - 15 - Checking the detection using a few examples, whereby the optimization of the detection parameters is carried out using pictures,
 - Automatic approach of all defects of the wafer or the wafers , whereby the respective defect is detected and a descriptor is assigned to the respective defect, and
 - 20 - Analysis and automatic grouping of the descriptors of the defect.
2. Method according to Claim 1, characterized in that the input of parameters and data, the selection of the elements present on the

semiconductor substrate, whereby the elements can be memory circuits, logic circuits, a bare wafer, without resist or with resist.

- 5 3. Method according to Claim 2, characterized in that the parameters or data of the layers on the wafer comprise the data of a polymer layer, an oxide layer, a contact or a metal layer.
- 10 4. Method according to Claim 1, characterized in that the user selects the lighting type, at least one lens used and a focus type.
- 15 5. Method according to Claim 4, characterized in that for the lighting type, bright field, UV or DUV is selected.
6. Method according to Claim 4, characterized in that the default setting is bright field and the lens has a 100X magnification.
- 20 7. Method according to Claim 4, characterized in that a manual two-point alignment is carried out, whereby a first point is aligned manually by approaching a table, that during the teaching of the first point data are automatically stored for the auto alignment file, and that each alignment point is taught with three different magnifications of the lens.
- 25 8. Method according to Claim 1, characterized in that the adjusting of the optimal intensity of lighting is achieved by random selection of a specific number of defects, approaching the selected defects, taking a picture of each defect with a start value for the brightness of the illumination and adjustment of the illumination using a histogram evaluation.
- 30 9. Method according to Claim 8, characterized in that for the adjusting of the optimal intensity of the lighting, only defects are used that are

no larger than 25% of the video picture width and height.

10. Method according to Claim 8, characterized in that 20 defects are used to adjust the intensity of the lighting.
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11. Method according to Claim 1, characterized in that of the automatically approached defects on the wafer, pictures are taken and temporarily stored until pictures are taken of all the defects.
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12. Method according to Claim 11, characterized in that after all the pictures are taken, these are shown on the display (11) as thumbnails.
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13. Method according to Claim 12, characterized in that a few thumbnails are rejected if the thumbnails exceed a threshold for the focus.
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14. Method according to Claim 1, characterized in that the analysis and automatic grouping of the descriptors of the defects divides the thumbnails of the defects recorded into groups and that on the display the first nine examples of a selected group of defects are displayed in a thumbnail representation.